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BEFORE THE
Federal Communications Commission

WASHINGTON, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
Replacement of Part 90 by Part 88)
to Revise the Private Land Mobile)
Radio Services and Modify the)
Policies Governing Them)

PR Docket No. 92-235

To: The Commission

COMMENTS OF THE
MONTANA POWER COMPANY

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SUMMARY

The Commission's refarming initiative, if adopted as proposed, would have a severe impact on many aspects of the Company's critical private land mobile and fixed operations conducted in the bands below 800 MHz. The proposed power

reduction would result in a significant loss of service to

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**COMMENTS OF THE
MONTANA POWER COMPANY**

The Montana Power Company, sometimes hereinafter referred to as "MPC" or the "Company", by its attorney, pursuant to the Notice of Proposed Rule Making ("Notice") adopted in the above-referenced proceeding, respectfully submits these Comments for consideration by the Federal Communications Commission.^{1/}

I. PRELIMINARY STATEMENT

1. MPC is an investor-owned utility providing electric and gas service to over 360,000 customers in the state of Montana. As an investor-owned utility, MPC

^{1/} Notice of Proposed Rule Making (FCC 92-469), released November 6, 1992. 7 FCC Rcd 8105 (1992).

receives no subsidies for the assumption of its responsibilities to its relatively small number of ratepayers. The Company's operating territory is approximately 107,600 square miles (roughly three-quarters of the entire State), and extends from the plains of eastern Montana to the rugged, remote and mountainous terrain of western Montana. The provision of electric service requires the Company to maintain approximately 10,000 miles of electric transmission lines and 14,000 miles of electric distribution lines, 2,000 miles of gas transmission pipelines, and 2,700 miles of gas distribution pipelines. In conjunction with these utility activities and responsibilities, MPC operates extensive private land mobile radio facilities that employ spectrum in the bands below 470 MHz which are the subject of the instant proceeding.

2. The provision of electric and gas service to Montana's residences and businesses over this varied and remote terrain requires a substantial investment in private land mobile radio equipment and transmitter sites, virtually

~~all of which is authorized and operated in the bands below~~

vast remaining expanse of Montana. Specifically, MPC maintains 66 mountain-top base/repeater stations; 87 local area base stations; 22 supervisory control and data acquisition (SCADA) master stations and 70 remote stations for gas distribution;^{2/} 19 SCADA master stations and 29 remotes for electric distribution; approximately 2,000 mobile and portable units; and 300 pagers. The communications made possible by these extensive private land mobile and fixed communications networks are essential to the reliable and safe operation of the Company's electric

blackouts or result in the loss of crucial natural gas supplies to large areas of the State.

3. In addition to these electric and gas distribution requirements, the Company has substantial public safety responsibilities to state and local government. For example, whenever a fire occurs, Company representatives are summoned by public safety agencies to the scene to advise on the status and location of natural gas and power connections and shut-off valves. In MPC's service area where 37 locations are staffed with two or fewer Company employees, the Commission can clearly see the critical role played by MPC's mobile communications system, particularly its paging system. MPC often has an operations employee working alone on a problem or assignment. In situations where climate and other factors mean you are risking someone's life by dispatching them to the scene of an incident, the absolute necessity to the Company of reliable mobile communications becomes apparent.

4. In this proceeding, the Commission has proposed rules and policies premised on the use of 6.25 kHz equipment for the 450 MHz band, and 5 kHz bandwidths for the 150 MHz band, by all new stations licensed after the effective date of the new rules. For existing systems, a two-stage

conversion process is proposed by the Commission: The first stage would involve reduction of transmitter frequency deviation for existing systems, thereby reducing their occupied bandwidth. Under the Commission's proposal, this first stage objective would be completed by January 1, 1996. The second stage objective would require the replacement of existing equipment with narrowband (or comparably efficient) equipment. The proposed timetable in the Notice would mandate that private land mobile radio systems in the state of Montana replace their equipment by January 1, 2012.

5. The Notice also proposes to maximize the re-use of local area frequencies by placing new restrictions on system effective radiated power (ERP) and height above average terrain (HAAT). In the 150-174 MHz and 450-470 MHz bands, a maximum ERP of 300 watts for base stations with an antenna HAAT not exceeding 197 feet is proposed. Power would be reduced for higher antennas, such that for an antenna HAAT exceeding 590 feet, the maximum ERP would be 5 watts. These power limitations would be imposed on existing stations on January 1, 1996. Further, the Notice would significantly alter the status and configuration of today's distinct private land mobile radio services. The Power Radio Service, in which MPC is a licensee, would be abolished and subsumed into the "Non-Commercial" category. Other changes

to the traditional Part 90 regulatory framework, including permitting exclusive-use operations in these frequency bands, are also proposed.

6. After considerable study, the Company presents in these Comments an analysis of the impact on the Company should the Commission's refarming proposal be adopted as described in the instant Notice. Briefly, the Notice's impact on a major utility serving a predominately rural and mountainous region is severe, and with respect to certain matters, disastrous. As detailed further below, the Company wishes to first emphasize that an objective look at the radio environment in Montana would lead one to conclude that in the state of Montana, and perhaps other rural areas throughout the nation, ought to be exempted from the Commission's proposal. Notwithstanding this observation, the Company has also reviewed the Consensus Plan submitted by the Land Mobile Communications Council (LMCC) to the Commission, and MPC believes that Plan presents a workable

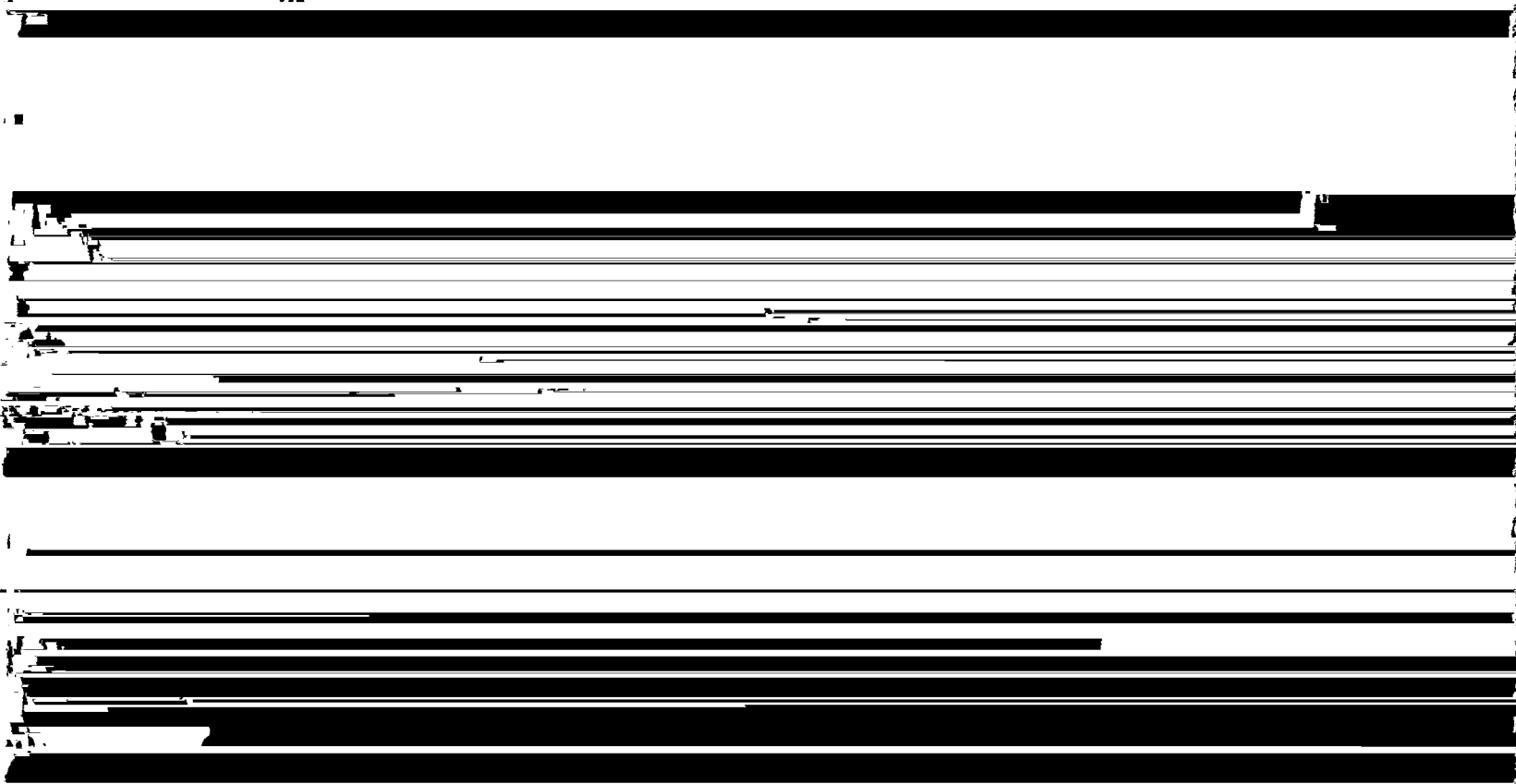
the Company wishes to detail, on the record, the serious impact on MPC of the Commission's proposal in this proceeding.

II. COMMENTS

7. MPC recognizes that the nation's larger urban areas have long suffered with frequency congestion, and its attendant problems including serious interference. However, the Company urges the Commission to recognize that Montana simply does not suffer from the severe frequency congestion in the bands below 470 MHz that plagues many urban areas, the amelioration of which lies at the heart of the Commission's refarming proposal. For example, Montana's

quality mobile radio communications system; this commitment and responsibility should not be compromised for the sake of meeting Commission goals designed to improve spectrum efficiency in the nation's largest urban areas.

8. Therefore, MPC respectfully submits that the Commission should hold itself open to entities in rural areas, such as MPC, filing for exemption from the rules ultimately adopted in this proceeding. Frequencies in the VHF/UHF bands are abundant in Montana,^{3/} obviating the need for refarming in the near term. Combined with the aforementioned population decrease in Montana, factors that would tend to force the refarming issue for the foreseeable future are not present either.^{4/} Should the Commission be determined, however, to proceed with its refarming



bandwidths in the 150-174 MHz band, represents a viable compromise alternative to the rules proposed in the instant Notice.

A. Reduction in Frequency Deviation May Be Infeasible and Will Have Serious Operational Impacts

9. While the Notice in this proceeding treats the proposed 1996 reduction in transmitter deviation as relatively minor, in reality such bandwidth reductions will severely impact the Company's basic mobile radio transmitting capabilities. As explained more fully below, reduction in frequency deviations will decrease the signal to noise ratio, resulting in poor coverage. As greater transmitter power will be required to obtain the same coverage, it is questionable whether today's land mobile radios can adequately function at these reduced bandwidths. MPC also has grave concerns about the availability, both short-term and long-term, of narrowband equipment. At this time, the Company cannot locate any equipment supplier that can supply 6.25 kHz narrowband radios for use in the United States. MPC understands that a Japanese supplier may be offering 6.25 kHz radios in Europe, but it is not known how this equipment performs and when it will be available in

this country.^{5/} The Company is generally concerned that the Notice does not recognize the "real-world" constraints facing the proposed conversion to narrowband technologies.

supervisory personnel, who are often scattered over a wide area, to the scene of emergency response situations involving electric and gas distribution. The Company is concerned that the Commission may have lost sight of the fact that paging systems employed by utilities are used for critical communications concerning the safety of life and property; not simple forwarding of personal telephone messages.

11. MPC also has severe reservations concerning whether the frequency deviation of older radios can be reduced. The Company's radio shop has experimented with some older radios (both crystal and synthesized) and has found that some equipment responds extremely poorly to attempts to reduce frequency deviation.^{6/}

^{6/} For example, one type of radio uses a small one-turn 215-degree rotation plastic potentiometer (IDC control). The normal setting of this control for ± 5 kHz deviation under the present rules is approximately 40 percent rotation or 100 degrees. Reducing deviation to ± 3 kHz requires the potentiometer to be set at about 15 percent rotation. The Company found that this setting resulted in erratic modulation because the wiper on the control was near the end of its rotation. Also, the CTCSS tone is part of this total deviation, and must be left at 0.6 kHz deviation for reliable operation. This means that the real microphone deviation is 2.4 kHz, a level which is much too low for older mobiles with 5 watt audio and portables with 0.5 watt audio, especially in noisy areas.

12. The Company has calculated that its approximate cost to reduce frequency deviation by 1996 would be approximately \$963,000. This high, almost million-dollar cost figure is required because in the Company's judgement, as detailed above, portable radios simply will not function properly at the reduced frequency deviation. The largest portion of these funds would be expended on replacing portables and older non-portable radios.

B. Reductions in Transmitter Power and Antenna Height Will Have a Devastating Impact on System Coverage

13. As noted earlier, MPC operates over an area of approximately 110,000 square miles, or roughly three-fourths of the State. To serve this vast area, MPC utilizes a radio system consisting of approximately 2,000 mobiles and portables plus a network of 150 base and repeater stations. Many of these base and repeater stations are in the mountainous area of western Montana where the average HAAT is 1941 feet. The Company has employed a computerized coverage program to investigate and document the impact on service area coverage of the Commission's proposed reduction in transmitter ERP. As evidenced by the two pairs of coverage maps (one showing the status-quo, the other under the proposal) for two representative antenna sites herewith submitted as Appendix A, the Company finds that a reduction

of approximately 70-80 percent in its existing coverage area can be expected. Preliminary estimates indicate the need for the construction of approximately 40 additional transmitter sites in order to obtain the required service area coverage. A considerable amount of engineering and analysis would be required to determine the exact number of additional sites. This estimated additional number of transmitter sites needed to obtain the desired coverage does not include those additional stations that would be needed to compensate for reductions in frequency deviation.

14. The Commission must understand that it is almost impossible to secure additional mountaintop antenna sites in the entire State of Montana. Virtually all mountaintops in the State are owned by Federal and State agencies. The present environmental regulations of the United States Forest Service, the U.S. Department of the Interior's Bureau of Land Management and the Montana Department of State Lands make transmitter site location and development very difficult at best, and most times impossible.

15. Most of the transmitter sites employed by the Company are either 65 watt or 100 watt stations, and the Company would have to reduce this power, in most cases, to 1.25 watts to comport with the Commission's proposal. The

Company has experimented at its radio shops with reducing the power by adjusting the power control circuitry, and we find that, physically switched down to its lowest point, the power of most stations cannot be reduced sufficiently to meet the proposed standard.^{7/} The conclusion of MPC's radio shop is that, at most, reductions of only 50-70 percent can be obtained. Accordingly, the Company would have to replace most of these stations. Further, the Company does not know exactly what would happen to the signal when the power is reduced. These coverage reduction issues translate into manpower safety concerns and primary questions about the viability of the Company's mobile communications system under the proposal. MPC notes emphatically that even under today's technical standards, its communications system has "dead" spots that require personnel to travel 3 to 4 miles out of a canyon in order to access a transmitter. Further degradations would be intolerable. Finally, questions remain as to whether there will be excessive spurious

^{7/} MPC's radio shop tested several VHF 100 watt base stations with standard power control circuitry, i.e., Motorola Micor MSR2000 and General Electric Mastr II series stations. Again, a small plastic potentiometer with approximately 240 degrees of total rotation is used as the controlling element. Complete counter clockwise rotation (or 0 degrees) resulted in approximately 40 watts output. Increasing the power, turning the control clockwise, resulted in 100 watts of power at about 140/150 degrees rotation. Further rotation resulted in no increase in power.

emissions, and whether power amplifiers will maintain their stability.^{8/}

C. Impact on Data Communications

16. MPC utilizes the 450-460 MHz band for operating supervisory control and data acquisition (SCADA) and other data systems for the Company's electric and gas distribution operations. Approximately 140 sites for master and remote communications are employed in connection with these systems. The Company doubts, however, if it could continue to employ its existing radios for these SCADA systems under the terms of the Commission's proposal. Existing radio paths have been designed to obtain the maximum coverage from a 25-watt transmitter in conjunction with 5 kHz transmitter

^{8/} The Company questions whether the Notice adequately tracks with the Commission's existing rules concerning type acceptance. For instance, if MPC installs attenuators, changes power amplifier design, or reduces power, these steps may represent fundamental changes in the equipment's type accepted design. Even the FCC's self-styled "screwdriver" adjustment to reduce frequency deviation represents the need to "open" the equipment and modify technical elements that are at the heart of the FCC's type acceptance program. As the Commission is aware, all mobile radios and transmitters employed in the private land mobile services are type accepted for use in a particular radio service. The FCC's grant of type acceptance is certified by the manufacturer, who places a certification label (which includes the type acceptance number) on the equipment. Any change to equipment design not approved by the Commission, renders the equipment illegal for use. The Company is concerned that the instant Notice does not adequately address these type acceptance issues.

deviations. Many of the master stations and remote sites are located above the 590 foot HAAT level, and therefore the Company would be required to reduce power at these sites to 5 watts ERP in order to comply with the rules. Such an ERP reduction would be devastating to such critical data communications. Further, the reduction in frequency deviation would cause SCADA problems by itself due to the adverse effects associated with a reduced signal to noise ratio. Presently, under current Part 90 rules, these systems are marginal. The Company fears the proposed Part 88 technical regulations would push these data systems over the edge into uselessness.

D. Economic Impact Severe

17. While the focus of the Company's concern is on the operational impact of the proposed rules, MPC must observe that the economic impact is quite significant as well. Simply put, the refarming proposal adversely affects the Company's entire VHF-UHF radio system. Our limited staff of radio technicians would be faced with a herculean task -- the conversion of 2200 radios by January 1, 1996 -- and our engineering staff would be required to devise and implement a large number of alternative coverage plans where feasible.

18. As noted earlier, the required equipment conversion imposed on 450-470 MHz band fixed links in the electric and gas SCADA systems would undoubtedly affect the reliability and operation of these links. MPC would have to replace them entirely with either newer equipment or with multiple address system equipment authorized for the 928/952 MHz band. The cost to convert this data equipment would be approximately \$820,000.

19. As noted earlier, the impact of the proposed power reductions would be severe. After attempting to reduce power from 100 watts to 1.25 watts at several sites by turning down the power control adjustment on both GE and Motorola units, the Company's radio technicians were unable to reduce power much more than 50-70 percent at any one station. The cost of reducing the power on existing equipment, or modifying existing equipment to meet the power reduction rules, would be approximately \$87,000. The cost to replace base stations that cannot be modified is approximately \$300,000, and the cost for the predicted 40 additional stations needed to fill in coverage gaps is approximately \$800,000. This totals to approximately \$1,187,000 in order to comply with power reductions.

20. Finally, an enormous commitment of engineering staff resources would have to be undertaken to implement the proposed rules. The relicensing of existing stations and planning process for new stations is estimated to consume approximately 430 work days approximating to \$129,000. Hence, the total cost of meeting the requirements proposed by the Notice is approximately \$3,099,000.

E. Exclusive Use Option Should Be Liberalized For Rural Areas Such As Montana

21. In keeping with the rural, relatively remote nature of our service area and communications facilities, MPC urges that licensees in rural areas should not be required to meet any loading standards in order to secure an exclusive use overlay. The Notice proposes that licensees in areas such as Montana must meet a 20 mobiles per channel standard in order to begin the process toward exclusivity. MPC submits that in rural areas, licensees should only be required to secure the necessary concurrences of co-channel licensees in order to apply for an exclusive use overlay. As noted earlier, in most cases, there will be few, if any, co-channel systems with which to coordinate in MPC's service area.

**F. MPC Views the LMCC Consensus Plan As a Workable
Compromise Alternative**

22. Notwithstanding the serious reservations expressed above concerning the Commission's Notice in this proceeding, and MPC's request that entities licensed in rural areas should be able to be exempted from compliance with the proposed rules, MPC has reviewed the Consensus Plan submitted to the Commission by the Land Mobile Communications Council (LMCC). The Company believes that the LMCC Consensus Plan represents a workable compromise alternative to the refarming proposal. Specifically, LMCC advances an implementation schedule to introduce 12.5 kHz bandwidths in both the 450 MHz and 150 MHz bands. Under this plan, licensees desiring primary status for their 450 MHz band systems would employ true 12.5 kHz equipment (or its equivalent) no later than the year 2004. For operations in the 150 MHz band, MPC supports LMCC's implementation process which is labeled "Option A" setting

fully completed 12.5 kHz conversion plan by January 1, 2004

conducted with sufficient power; and (3) though it may not be "politically correct" to voice the objection, MPC is concerned that there are no known American manufacturers of 6.25 kHz equipment.


23. Further, MPC believes there is a great deal of merit to LMCC's alternative plan for implementing reduced ERP, especially in light of the fact that the LMCC recognizes the critical role played by the applicant's or licensee's required service area radius. By factoring in the concept of required service areas, and recognizing the differences between VHF and UHF propagation patterns, the LMCC's dual "safe harbor" tables of permissible power/HAAT combinations make an important contribution to achieving overall spectrum efficiency goals while satisfying critical user service area requirements. MPC is pleased that the LMCC power reduction proposal offers those applicants and licensees with critical service area responsibilities who may require power levels in excess of the value specified in the tables the option of submitting coverage contours demonstrating that the power requested correlates to the need to cover a required service area.^{9/}

^{9/} The Company agrees with the use of the R-6602 model and the tables in LMCC appendix A, B, C, and D.

WHEREFORE, THE PREMISES CONSIDERED, the Montana Power Company hereby respectfully submits the foregoing Comments and urges that the Federal Communications Commission act in a manner fully responsive to the recommendations therein.

Respectfully submitted,

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Appendix A: Coverage Maps for Two Representative Antenna Sites

Dated: May 28, 1993

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This page has been substituted for one of the following:

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